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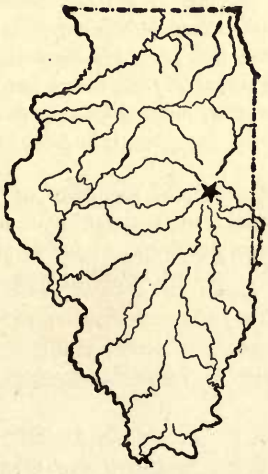
BULLETIN No. 183

PRICES AND SHRINKAGE OF FARM GRAINS

By W. L. BURLISON and O. M. ALLYN



URBANA, ILLINOIS, NOVEMBER, 1915

Summary of Bulletin No. 183

1. Prices of farm crops in general are regulated by commercial market quotations, which in turn are governed by supply and demand. Page 13

2. The increase in prices of crops within the last few decades has not been so great as many people have believed. By comparing the average prices for the fifteen years preceding the financial crisis of 1894 to 1898, with the average prices for the fifteen years succeeding this period, it will be seen that the average increase has been only 9.2 cents per bushel for corn and 6.5 cents for oats, while the average price for wheat has not increased. The price for barley has tended to decrease, while the price for rye has increased about the same as that for corn. Page 14

3. In general, for the last thirty years the times of lowest average price for corn, wheat, and oats correspond closely to the times of largest average receipts. Except during the summer months, the same is true for rye, and also for barley during the last ten years. Pages 16-21

4. Shrinkage is one of the most important factors to be taken into consideration in holding corn for higher prices. The total shrinkage during the year is more than 15 percent. Taking November as a base, the data show that there is no month for which the price increases sufficiently to compensate for shrinkage. If January or February is taken as a base, then the increase in price, up to but not including October, more than compensates for shrinkage alone. Page 21

5. Not so much is known of the shrinkage of wheat and oats as of corn. It may be said that they shrink comparatively little after they have gone thoroly thru the sweat. It would seem profitable, so far as shrinkage alone is concerned, to hold small grain until the time of highest prices. Page 24

PRICES AND SHRINKAGE OF FARM GRAINS

By W. L. BURLISON, Associate Chief in Crop Production, and
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When is the best time to sell my crop? Will I make more by holding my grain, expecting later a price which will more than compensate for the shrinkage which will occur during the intervening period, or will it be more profitable to sell my corn from the field and my small grain from the threshing machine? These are questions which are coming up continually, and which have called for the issuance of this bulletin. In the handling of farm grains, especially corn, shrinkage plays an important rôle, and the shrinkage factor should always be considered when the producer is holding his grains for higher prices.

The facts relating to the problem, so far as they are available, are herein presented. These facts should prove a valuable guide; however, because of the nature of the subject, the element of chance is always involved, and the individual farmer must make the final decision as to the time to sell.

It is probable that the average price of farm crops for a ten-year period will represent what the farmer may expect for his commodities under normal conditions. The reports of the Chicago board of trade are the most complete of any in America, and should be very reliable, for Chicago is the largest and probably the most important grain market in the United States. Since Chicago is the controlling market for Illinois, the price calculations reported in this bulletin are based on the reports of the Chicago board of trade.[1] Figures for 1914 have been eliminated because of abnormal prices due to the European war.

Prices of farm crops in general are regulated by commercial market quotations, which in turn are governed normally by supply and demand. Thru the boards of trade or exchanges, the large commercial grain and provision markets report the daily quotations for all kinds of farm produce and these reports are sent over the country by wire and by mail. It is upon these quotations that the local grain dealers and elevator managers depend in giving local prices to the farmer.

In estimating the price which he may receive, the grower should keep in mind that the local grain dealer must pay less for crops than

[1]Prices for standard grade only used.

the large commercial markets, such as Chicago or St. Louis. The main factors which the local dealer considers in the management of his business are the following:

1. Working capital and interest on money invested
2. Maintenance and running expenses
3. Salary of operator
4. Insurance on elevator and contents
5. Freight to terminal markets
6. Shrinkage
7. Inspection, switching charges, and weighing commission
8. Insurance and storage at terminal market

These items are so variable that it is well nigh impossible to cite a figure which might give the farmer a safe basis upon which to estimate farm prices. Dealers must buy on a margin which will enable them to handle profitably the different crops. Usually the dealer's working margin is not exorbitant, but is fairly uniform for a given locality, and much confidence can be placed in the relative prices quoted by the local dealer and the large terminal markets.

There seems to be a feeling among farmers that the prices of crops have increased very materially within the last few decades. Table 1 gives the average price[1] of corn, wheat, and oats in five-year periods

TABLE 1.—AVERAGE PRICE OF FARM GRAINS, BY FIVE-YEAR PERIODS, FROM 1879 TO 1913
(Cents per bushel)

Crop	1879 to 1883	1884 to 1888	1889 to 1893	1894 to 1898	1899 to 1903	1904 to 1908	1909 to 1913	General average
Corn	48.7	43.1	43.0	33.2	45.5	53.7	63.2	47.2
Wheat	106.7	81.6	83.4	69.5	73.4	93.3	105.1	87.6
Oats	33.5	27.9	30.0	23.2	30.6	39.1	41.4	32.2
Barley	....	62.3[1]	63.6	40.9	48.8	55.5	74.2	57.7
Rye	....	56.1[2]	59.5	44.0	53.3	71.5	77.9	60.4

[1]Prices for 1884 and 1888 are not reported in full.
[2]Prices for 1884 are not reported in full.

TABLE 2.—AVERAGE PRICE OF FARM GRAINS, BY FIFTEEN-YEAR PERIODS
(Cents per bushel)

Crop	1879 to 1893	1899 to 1913	Increase in price for 1899-1913 over 1879-1893
Corn	44.9	54.1	9.2
Wheat	90.6	90.6	0.0
Oats	30.5	37.0	6.5
Barley	63.0[1]	59.5	(–3.5)
Rye	58.0[1]	67.8	9.8

[1]Averages for 1884 to 1893. See also footnotes to Table 1.

[1]All price averages reported in this bulletin are based upon daily averages made up of the lowest and highest daily wholesale market prices. The data involve more than 175,000 calculations.

for the past thirty-five years[1] and for barley and rye as far back as figures are available in the trade reports. A hasty inspection of this table might seem to confirm this impression. However, the actual advance has not in reality been so great as might appear. The years covered by the statistics include a period of great business depression. In fact, the first five-year period, that from 1879 to 1883, just preceded a decided reduction in prices. By another sudden decrease, prices reached their lowest limit in the period 1894 to 1898. Since that time, there has been a steady increase.

A better conception of the actual advance in prices may be obtained by comparing the average prices for the fifteen years preceding the financial crisis of 1894 to 1898 with the average prices for the fifteen years succeeding this period. These figures are given in Table 2 in full for corn, wheat, and oats, and for a part of this period for barley and rye. Comparing prices on this basis, it will be seen that the average increase has been only 9.2 cents per bushel for corn, and 6.5 cents for oats, while the average price for wheat has not increased. The tendency for the price of barley has been to decrease, while rye has increased about the same as corn.

The relative prices for the different months of the year require further discussion. Table 3, which follows, gives this information for corn, wheat, oats, barley, and rye on the Chicago market. The actual farm price of crops varies so greatly with local conditions that it is impossible to establish a uniform farm price for Illinois.

TABLE 3.—AVERAGE PRICE OF FARM GRAINS FOR THE TEN-YEAR PERIOD 1904-1913

(Cents per bushel)

Month	Corn	Wheat	Oats	Barley	Rye
January	52.0	100.1	39.5	67.2	74.0
February	52.5	100.9	40.9	66.1	75.2
March	54.4	100.7	40.9	67.4	75.8
April	57.2	101.5	41.7	67.1	76.5
May	60.3	106.3	43.4	67.3	79.4
June	60.3	103.4	43.4	64.4	76.6
July	62.1	95.2	42.8	61.5	73.2
August	64.2	92.3	37.8	60.2	71.0
September	63.6	95.6	38.6	63.9	73.1
October	60.5	98.4	38.0	63.8	75.0
November	58.3	97.4	37.6	64.3	73.8
December	55.7	98.8	38.6	65.6	73.3
Average	58.4	99.2	40.3	64.9	74.7

[1]Specie payment was resumed January 1, 1879, previous to which time prices are not comparable, because of the depreciated currency.

In considering the best time of the year to market his crops, the farmer should bear in mind that his margin of profit depends upon net prices, not gross, and that the highest gross price per bushel or per ton does not necessarily mean the most profitable one. The factors which should be balanced against the advance in price from month to month over the price at harvest time are interest, shrinkage, storage, and extra cost of handling, which factors, with the possible exception of shrinkage, will have to be determined by the farmer himself.

The monthly price averages for farm grains, shown in Table 3, together with the monthly percentages of total annual receipts, for the

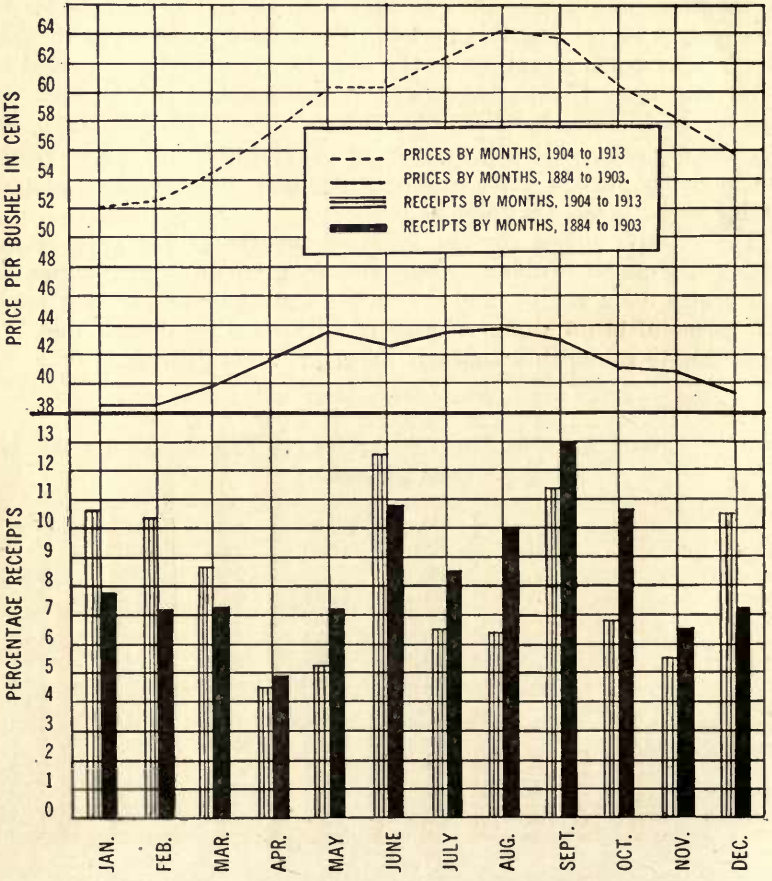

FIG. 1.—**Corn:** Average Monthly Price and Average Monthly Percentage of Total Annual Receipts for the Ten Years 1904-1913; also Price and Percentage Receipts for the Previous Twenty Years

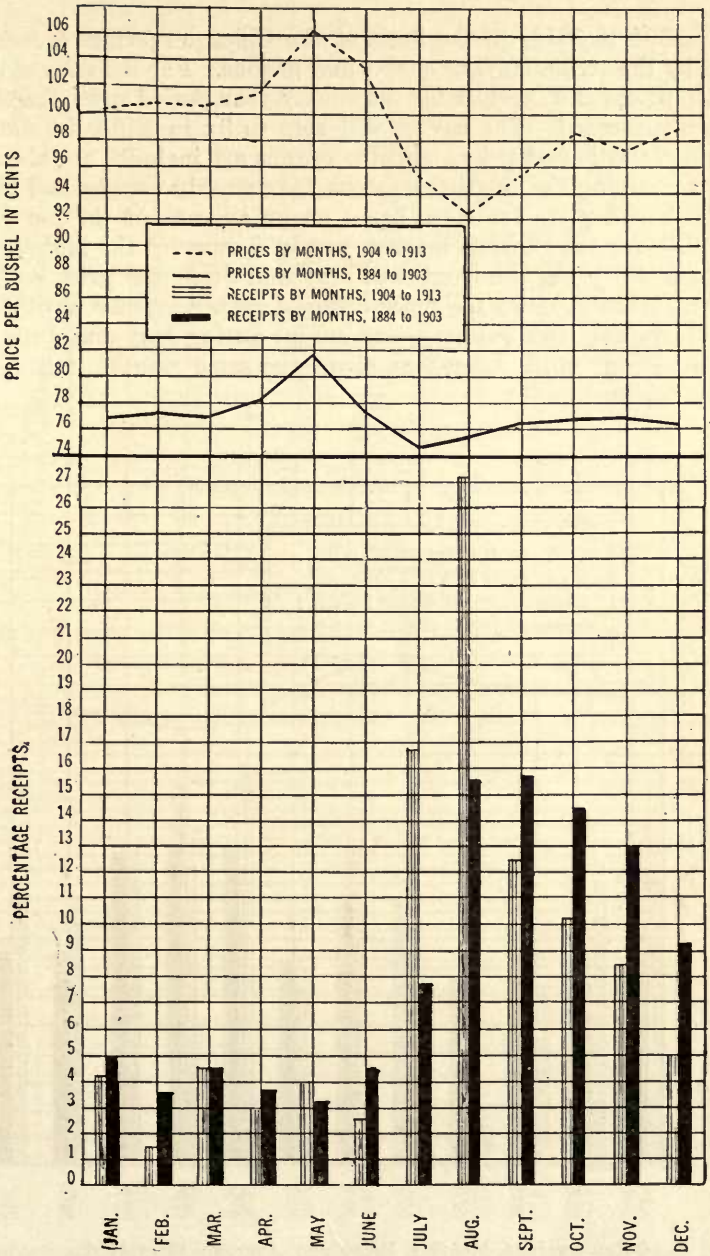

FIG. 2.—**Wheat:** Average Monthly Price and Average Monthly Percentage of Total Annual Receipts for the Ten Years 1904-1913; also Price and Percentage Receipts for the Previous Twenty Years

decade 1904 to 1913, on the basis of the Chicago market, are represented by the accompanying curves and graphs. For the sake of comparison, prices and receipts for the twenty-year period preceding 1904 are also presented. The curves will help to fix in mind the months of highest and lowest prices, and the graphs are included for the purpose of studying the relation between the monthly supply and price.

The lowest price for corn, based on an average of the ten years 1904-1913, for the Chicago market, was in January; the highest was in August. During the months of May and June, the price was stationary. After August, the price declined rather rapidly until January. Beginning with January, and except during May and June, the price advanced until August at about the same rate as it had previously declined.

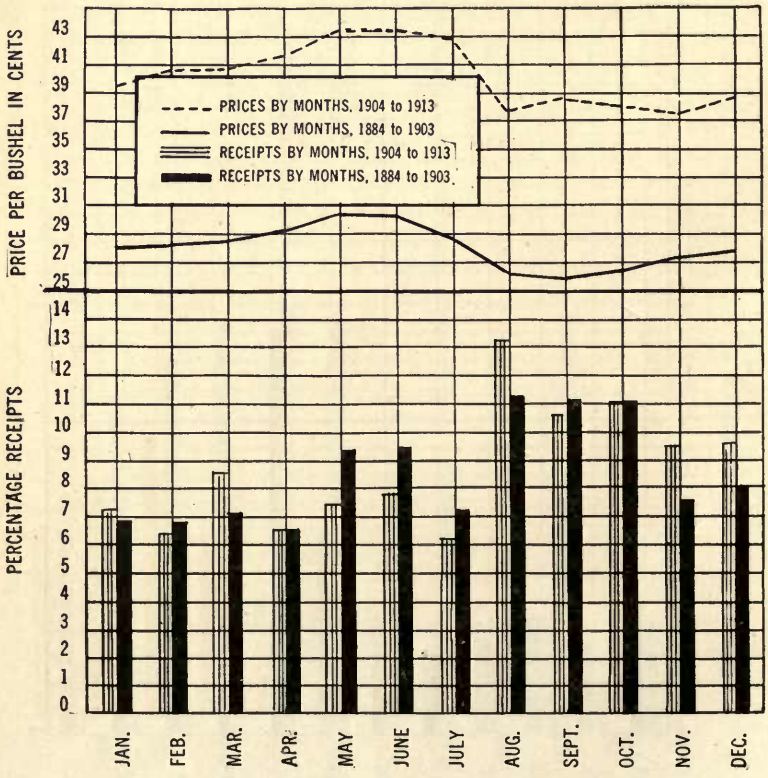

FIG. 3.—**Oats:** Average Monthly Price and Average Monthly Percentage of Total Annual Receipts for the Ten Years 1904-1913; also Price and Percentage Receipts for the Previous Twenty Years

The monthly percentage of the total annual receipts for the same ten-year period declined gradually from January to April, and increased in May and June. From July to November the receipts were somewhat low, except for September, but they were higher from December to March. They were almost as great in September as in June, the month of highest percentage receipts.

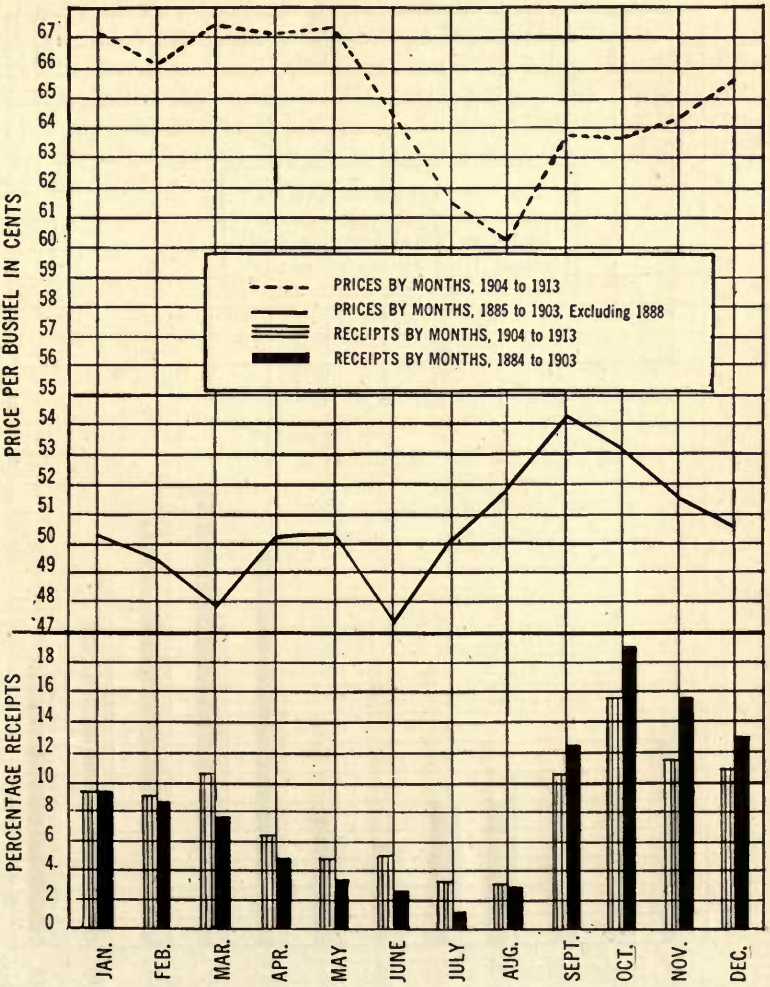

FIG. 4.—**Barley**: Average Monthly Price and Average Monthly Percentage of Total Annual Receipts for the Ten Years 1904-1913; also Price for the Previous Nineteen Years (Excepting 1888) and Percentage Receipts for the Previous Twenty Years

It must be evident that if the average price of corn did not increase from January to August, the farmer would lose to the extent of the shrinkage on all corn held. Whether the advance in the market price between the time of cribbing and the time of marketing is sufficient to compensate fully for the shrinkage which occurs, is another question, which will be considered under "Shrinkage of Corn."

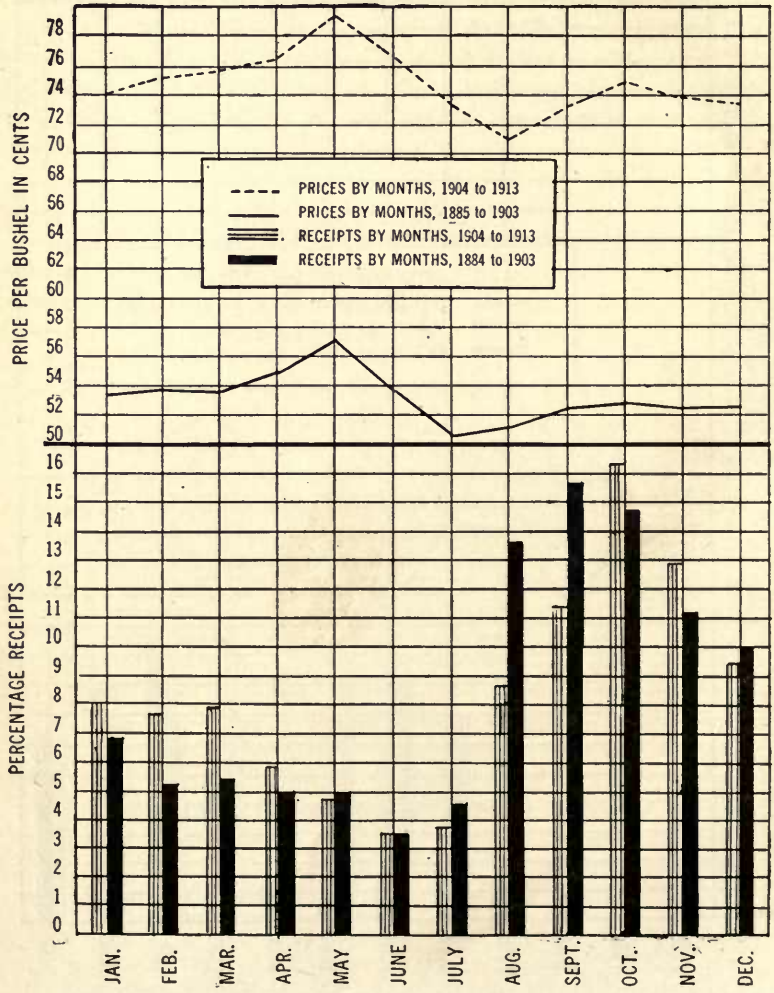

FIG. 5.—**Rye:** Average Monthly Price and Average Monthly Percentage of Total Annual Receipts for the Ten Years 1904-1913; also Price for the Previous Nineteen Years and Percentage Receipts for the Previous Twenty Years

Attention is called to the marked similarity in the two curves and in the two graphs.

With wheat, the times of lowest average price correspond closely to the times of largest average receipts; the highest average prices with the months of lowest average receipts.

With oats, also, the months of lowest average price correspond closely to the months of highest receipts.

The prices for barley during the last ten years, and for rye during both periods, show a marked tendency to decrease in anticipation of increased receipts, which is not the case, as a rule, with corn, wheat, and oats. With the exception of the summer months, the tendency in the prices and receipts for barley and rye is about the same as for corn, wheat, and oats; that is, when the receipts are relatively high, the prices are low, and vice versa.

SHRINKAGE OF CORN

Shrinkage is one of the most important factors in the handling of the corn crop, especially if the grain is to be held for higher prices.

In 1903 the Illinois Station began an experiment to determine the rates of shrinkage of ear corn. Each year about 300 bushels of corn was hauled direct from the field and placed in an open crib, protected by tight roof and by slat sides, where it was left until the next crop was gathered. Four times each month the crib and its contents were weighed to determine the shrinkage. The average of the four weighings was taken as the monthly average from which to compute the shrinkage of the corn. The results are presented in Table 4.

TABLE 4.—AVERAGE SHRINKAGE OF CORN BY MONTHS, FOR THE YEARS 1903-1913,[1] URBANA, ILLINOIS

(Expressed in percentage)

Month	1903	1905	1906	1907	1909	1910	1911	1912	1913	Average to date	Monthly average
Nov...	.8	2.5	1.06	(–.07)	1.81	....	1.87	....	....	1.33	...
Dec...	3.2	5.5	2.82	2.18	4.54	1.17	5.01	1.65	....	3.26	1.93
Jan...	4.5	6.7	3.32	4.52	4.80	2.70	6.76	2.98	1.13	4.16	.90
Feb...	5.6	8.6	4.88	6.30	6.45	3.83	7.48	3.90	2.28	5.48	1.32
Mar...	6.9	8.5	7.25	9.35	9.19	6.94	7.58	5.01	1.85	6.95	1.47
Apr...	11.1	10.0	10.48	12.37	13.53	8.73	11.44	7.19	5.06	9.99	3.04
May..	15.4	13.6	11.86	13.76	13.74	12.41	17.10	11.17	8.85	13.10	3.11
June..	17.9	14.2	13.20	16.79	15.69	15.14	20.31	13.16	11.25	15.29	2.19
July..	19.0	15.3	14.12	18.02	15.71	16.78	20.31	13.62	12.52	16.15	.86
Aug..	20.2	15.1	14.78	19.00	15.56	16.92	21.17	13.51	13.26	16.61	.46
Sept..	19.8	15.2	15.18	20.10	14.77	15.42	21.28	13.70	12.06	16.39	(–.22)
Oct...	19.8	...	15.52	20.55	14.91	14.70	21.64	12.23	13.03	16.54	.15
Nov...	19.9	...	15.10	20.16	15.41	14.74	21.58	11.16	12.38	16.30	(–.24)
Dec...	...	...	....	.....	....	....	....	10.09	....	....	....

[1]With the exception of 1904 and 1908, for which data are unavailable.

In these experiments the months of maximum shinkage were found to be April, May, and June. After January there was a gradual increase in the shrinkage rate until May, and from that point on there was a decided decrease. The corn reached its minimum weight in August.

The Ohio Station conducted shrinkage experiments for six years, but the method employed was so different from that used by the Illinois Station that the results obtained by the two stations are not directly comparable. Nevertheless, in a general way, their results confirm those of the Illinois Station. In discussing the Ohio experiments, Williams and Welton make the following statement:[1]

To determine the loss of moisture in ear corn month by month thruout the year, 100 pounds were stored in a box on the second floor of a corn crib, November 1, 1908, and weighed the first of each month thereafter for a year. The sides and top of box, being made of wire netting, the conditions for drying out were favorable. Barring a few exceptions, the shrinkage for each year has increased gradually, reaching a maximum the first of July, August, or September, depending upon climatic conditions. The maximum shrinkage has ranged from 6.5 to 24.75 percent, and, as an average of six years, is 19.96 percent. This has occurred August 1. As the cool, moist weather of fall approaches, the corn begins to take up moisture, hence the slightly lower percentage of shrinkage in September and October.

Iowa has carried on investigations similar to those reported above for Illinois and Ohio, with essentially the same results.

Since the investigations of Illinois, Iowa, and Ohio are not directly comparable, and since the work of Illinois is more extensive than the

TABLE 5.—PROFIT OR LOSS FROM HOLDING CORN

Month	Percentage shrinkage up to and including month given	Price per bushel necessary to compensate for shrinkage	Actual ten-year average price 1904-13	Loss per bushel based on November price	Profit per bushel based on February price
		cents	*cents*	*cents*	*cents*
November	.....	.....	58.30	.....	.....
December	3.26	60.26	55.70	4.56	.....
January	4.16	60.83	52.00	8.83	.....
February	5.48	61.68	52.50	9.18	.....
March	6.95	62.65	54.40	8.25	.93
April	9.99	64.77	57.20	7.57	1.61
May	13.10	67.09	60.30	6.79	2.39
June	15.29	68.82	60.30	8.52	.66
July	16.15	69.53	62.10	7.43	1.75
August.....	16.61	69.91	64.20	5.71	3.47
September	16.39	69.73	63.60	6.13	3.05
October	16.54	69.85	60.50	9.35	(–.17)

NOTE.—Buyers may take more corn for a bushel in November; if so, this fact should also be considered by the farmer.

[1]Ohio Exp. Sta. Bul. 282, Corn Experiments. 1915.

others, the results obtained by Illinois are used as a basis for the calculations which appear in Tables 5 and 6.

An inspection of Table 5 shows that there is no month after November for which the price increases sufficiently to compensate for shrinkage. In fact, the price decreases until January. If, however, January or February is taken as a base, prices being lowest during those months, then the increase in price during the succeeding months, up to but not including October, more than compensates for shrinkage alone.

TABLE 6.—CORN: PRICES NECESSARY EACH MONTH TO COMPENSATE FOR SHRINKAGE

(Cents per bushel based on November price)

November price	To compensate for shrinkage, the price should be:										
	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
40	40.5	41.3	41.7	42.3	43.0	44.4	46.0	47.2	47.7	48.0	47.8
41	41.6	42.4	42.8	43.4	44.1	45.6	47.2	48.4	48.9	49.2	49.0
42	42.6	43.4	43.8	44.4	45.1	46.7	48.3	49.6	50.1	50.4	50.2
43	43.6	44.4	44.9	45.5	46.2	47.8	49.5	50.8	51.3	51.6	51.4
44	44.6	45.5	45.9	46.6	47.3	48.9	50.6	51.9	52.5	52.8	52.6
45	45.6	46.5	47.0	47.6	48.4	50.0	51.8	53.1	53.7	54.0	53.8
46	46.6	47.6	48.0	48.7	49.4	51.1	52.9	54.3	54.9	55.2	55.0
47	47.6	48.6	49.0	49.7	50.5	52.2	54.1	55.5	56.1	56.4	56.2
48	48.6	49.6	50.1	50.8	51.6	53.3	55.2	56.7	57.2	57.6	57.4
49	49.7	50.7	51.1	51.8	52.7	54.4	56.4	57.8	58.4	58.8	58.6
50	50.7	51.7	52.2	52.9	53.7	55.5	57.5	59.0	59.6	60.0	59.8
51	51.7	52.7	53.2	54.0	54.8	56.7	58.7	60.2	60.8	61.2	61.0
52	52.7	53.8	54.3	55.0	55.9	57.8	59.8	61.4	62.0	62.4	62.2
53	53.7	54.8	55.3	56.1	57.0	58.9	61.0	62.6	63.2	63.6	63.4
54	54.7	55.8	56.3	57.1	58.0	60.0	62.1	63.7	64.4	64.8	64.6
55	55.7	56.9	57.4	58.2	59.1	61.1	63.3	64.9	65.6	66.0	65.8
56	56.8	57.9	58.4	59.2	60.2	62.2	64.4	66.1	66.8	67.2	67.0
57	57.8	58.9	59.5	60.3	61.3	63.3	65.6	67.3	68.0	68.4	68.2
58	58.8	60.0	60.5	61.4	62.3	64.4	66.7	68.5	69.2	69.6	69.4
59	59.8	61.0	61.6	62.4	63.4	65.5	67.9	69.6	70.4	70.8	70.6
60	60.8	62.0	62.6	63.5	64.5	66.7	69.0	70.8	71.6	72.0	71.8
61	61.8	63.1	63.6	64.5	65.6	67.8	70.2	72.0	72.7	73.2	73.0
62	62.8	64.1	64.7	65.6	66.6	68.9	71.3	73.2	73.9	74.3	74.2
63	63.8	65.1	65.7	66.7	67.7	70.0	72.5	74.4	75.1	75.5	75.3
64	64.9	66.2	66.8	67.7	68.8	71.1	73.6	75.6	76.3	76.7	76.5
65	65.9	67.2	67.8	68.8	69.9	72.2	74.8	76.7	77.5	77.9	77.7
66	66.9	68.2	68.9	69.8	70.9	73.3	75.9	77.9	78.7	79.1	78.9
67	67.9	69.3	69.9	70.9	72.0	74.4	77.1	79.1	79.9	80.3	80.1
68	68.9	70.3	71.0	71.9	73.1	75.5	78.3	80.3	81.1	81.5	81.3
69	69.9	71.3	72.0	73.0	74.2	76.7	79.4	81.5	82.3	82.7	82.5
70	70.9	72.4	73.0	74.1	75.2	77.8	80.6	82.6	83.5	83.9	83.7
71	72.0	73.4	74.1	75.1	76.3	78.9	81.7	83.8	84.7	85.1	84.9
72	73.0	74.4	75.1	76.2	77.4	80.0	82.9	85.0	85.9	86.3	86.1
73	74.0	75.5	76.2	77.2	78.5	81.1	84.0	86.2	87.1	87.5	87.3
74	75.0	76.5	77.2	78.3	79.5	82.2	85.2	87.4	88.3	88.7	88.5
75	76.0	77.5	78.3	79.3	80.6	83.3	86.3	88.5	89.4	89.9	89.7
76	77.0	78.6	79.3	80.4	81.7	84.4	87.5	89.7	90.6	91.1	90.9
77	78.0	79.6	80.3	81.5	82.8	85.5	88.6	90.9	91.8	92.3	92.1
78	79.1	80.6	81.4	82.5	83.8	86.7	89.8	92.1	93.0	93.5	93.3
79	80.1	81.7	82.4	83.6	84.9	87.8	90.9	93.3	94.2	94.7	94.5
80	81.1	82.7	83.5	84.6	86.0	88.9	92.1	94.4	95.4	95.9	95.7

To facilitate finding the price per bushel necessary each month to compensate for shrinkage when holding corn which ranges in price from 40 to 80 cents per bushel as an average for November, Table 6 has been constructed, based on shrinkage data included in Table 5.

SHRINKAGE OF WHEAT AND OATS

It may be said that wheat and oats shrink comparatively little after the grain has gone thoroly thru the sweat. Where small grain is stored in large elevators, it is estimated that the shrinkage runs from 1 to 2 percent in six months.

TABLE 7.—AVAILABLE DATA ON THE SHRINKAGE OF WHEAT WHICH MIGHT APPLY TO ILLINOIS CONDITIONS

Station	Length of storage	Condition of tests	Percentage shrinkage
Ohio	3 years	14 samples, thoroly dry, stored in bin of wheat for nearly 1 year; then left in corner of bin until expiration of 3 years....	0 to 4.94 Av. 2.32
Michigan..	332 days	Wheat dry and in good condition. Bins open at top. Soft White	.5
		Hard Red	.1
Michigan..	10 days	1500 bushels stored in elevator in hard and dry condition after threshing. (Christian Breisch & Co., Millers, North Lansing, Michigan).....	2.0

TABLE 8.—AVAILABLE DATA ON THE SHRINKAGE OF OATS WHICH MIGHT APPLY TO ILLINOIS CONDITIONS

Station	Length of storage	Condition of tests	Percentage shrinkage
Ohio	Sept., 1892 to March, 1893 (about 6 mos.)	54 varieties aggregating 4243 lbs., recleaned, hung in ordinary bags, in artificially warmed rooms.....	1.00
Michigan..	Aug. 11, 1896 to March 18, 1897 (7 mos. 7 days)	100 bushels binned, without recleaning, 1 hour after threshing. Dry conditions, but wet once with rain while in shock	.21
Michigan..	Sept. 13, 1897 to March 1, 1898 (5 mos. 17 dys.)	Stored in sheep barn 806 lbs. International oats..... 550 lbs. New Marine oats	1.61 2.00
Michigan..	Oct. 8, 1899 to May 10, 1900 (7 mos. 2 dys.)	1038 lbs. stored in tight bin in Experiment Station barn	3.40

NOTE.—Data in Tables 7 and 8 are taken from Mich. Exp. Sta. Bul. 191, Shrinkage of Farm Products, by C. D. Smith. 1901.

The chief causes of shrinkage of wheat and oats stored on the farm are rats, mice, and granary insects. When small grains are held over from threshing time until the following year, one may count very safely, under normal conditions, on a shrinkage of not more than 1 or 2 percent; and when the grain is very dry when threshed, the subsequent gain by absorption of moisture in damp weather may amount to as much or more than the normal shrinkage.

The fact that grains fluctuate in weight according to the temperature and humidity of the atmosphere, is brought out by a study of Table 4 (see August to November) and by the following results reported for other experiments:

Hilgard,[1] of California, found that when wheat and oats were placed in air saturated with moisture, the gain in weight at 64.4° F. was as follows:

Oats	19.8 percent (18 days)
Wheat	18.8 percent (14 days)

The increase in all cases was very rapid at first; in fact half the total increase occurred during the first twenty-four hours. After that, the rate of absorption decreased slowly until the thirteenth or fourteenth day, when a sudden increase occurred due to growth of mold on the grains.

In the same experiment Hilgard found that when air-dry grain was exposed to artificially dried air at the same temperature (64.4° F.) for 18 days, the loss in weight was as follows:

Oats	9.3 percent
Wheat	6.2 percent

Sanborne[2] found that even in the dry climate of Utah, wheat gained slightly in weight during winter storage.

Harris and Thomas[3] report that, contrary to popular opinion, there is a gain of 2½ to 4½ percent, instead of a loss, in the weight of small grain, like wheat and oats, during the fall after harvest. They found that in every case the grain weighed less at threshing time than at any other time, and that there was a gain in weight during the winter and a loss during the summer. While these data may not apply to Illinois conditions, they show that small grains which may be very dry when threshed, take up moisture thereafter, if the humidity is high, thus gaining in weight.

[1]Reported in Mich. Exp. Sta. Bul. 191.
[2]Reported in Mich. Exp. Sta. Bul. 191.
[3]Utah Exp. Sta. Bul. 130.

Having determined the months of highest average prices for wheat and oats (see Figs. 2 and 3), the question naturally arises whether these crops can, as a rule, be held with profit for higher prices. The question is answered, with respect to shrinkage, in Table 9, assuming in one case that the grain be marketed after threshing in August, and in the other that it be stored until the following year, when a shrinkage of 1½ percent may be counted on.

TABLE 9.—GAIN FROM HOLDING WHEAT AND OATS FOR HIGHEST PRICE
(Cents per bushel)

Crop	Ten-year average price for August	Price necessary to compensate for 1.5 percent shrinkage	Highest ten-year average price	Gain by holding for highest price
Wheat ..	92.3	93.7	106.3 May	12.6
Oats	37.8	38.4	43.4 May-June	5.0

Considering the ten-year period, it would seem to be profitable, so far as shrinkage alone is concerned, to hold small grain until the time of highest prices; but there are other factors, such as conveniences in making delivery, condition of roads, cost of labor and storage, losses by rats and mice, and by insects (weevil, etc.), so local in character that only the individual farmer can give them proper consideration.